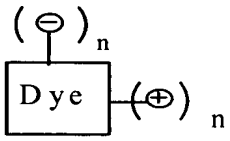


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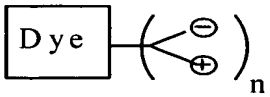
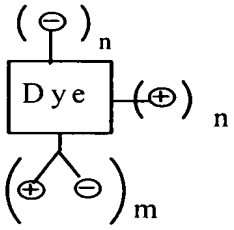
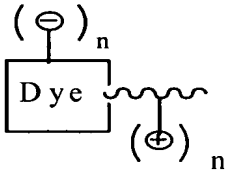



B




C

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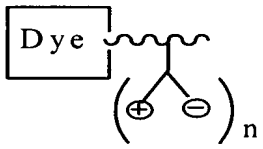
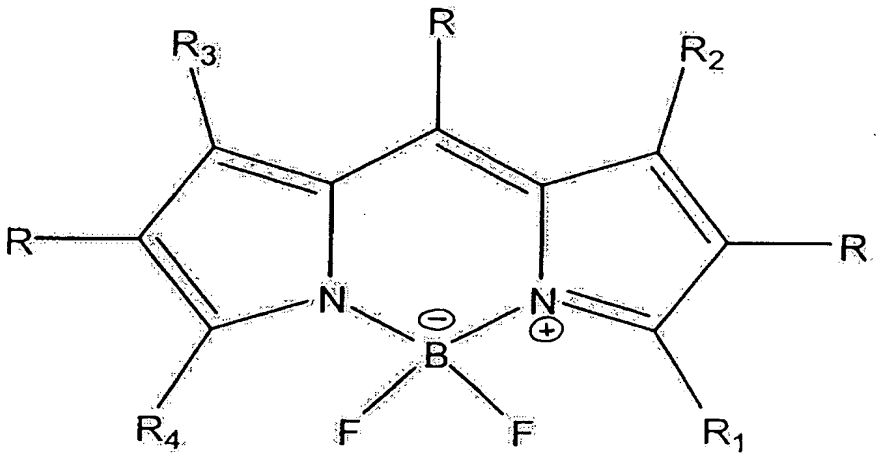


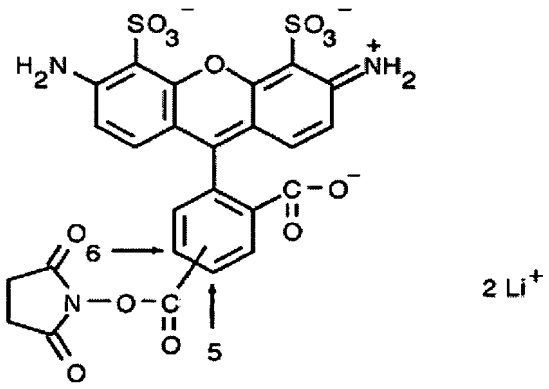

E

FIGURE 1



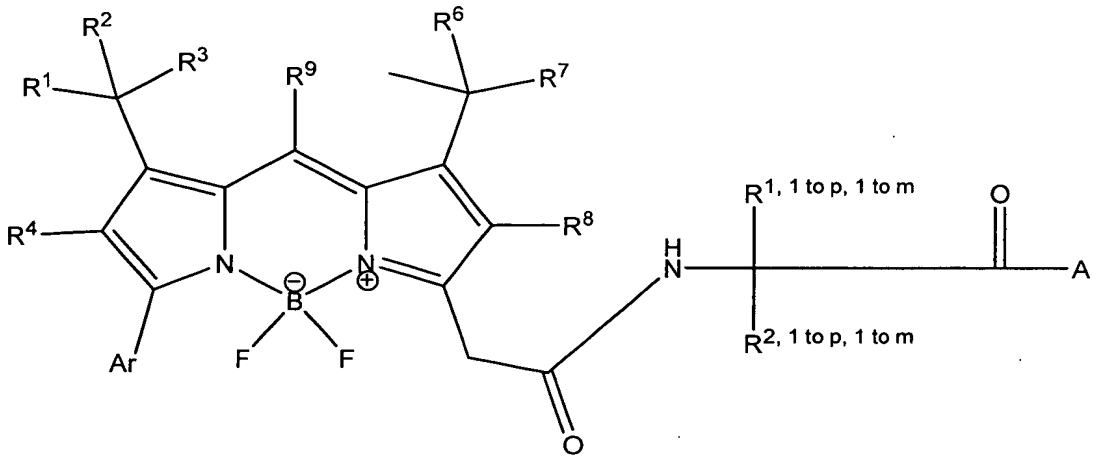

**BODIPY fluorophore, 4,4-difluoro-4-bora-3a,4a-diaza-*s*-indacene**

FIGURE 2



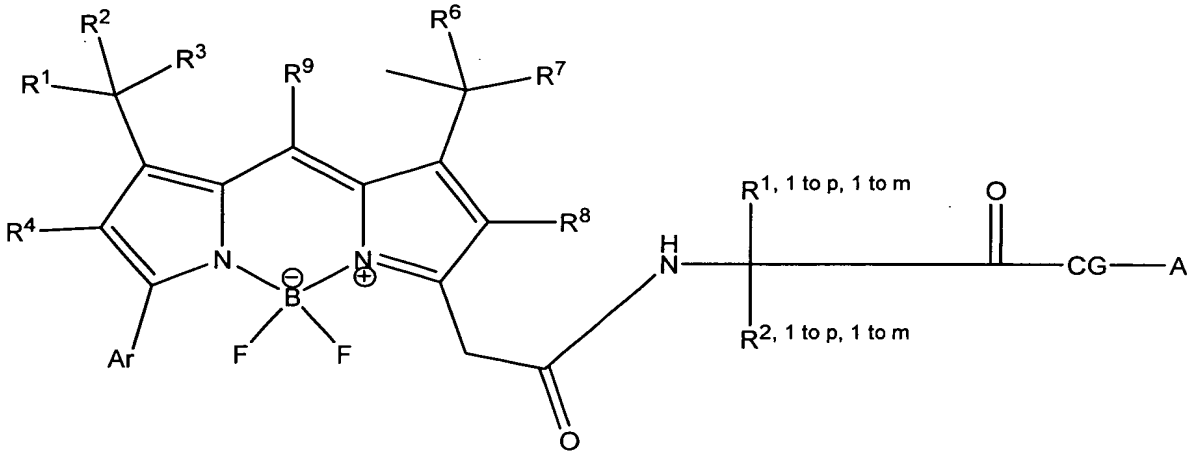

Alexa Fluor ® 488 carboxylic acid, succinimidyl ester dye structure

FIGURE 3




**General structure of an optical labeling molecule comprising a BODIPY dye moiety**

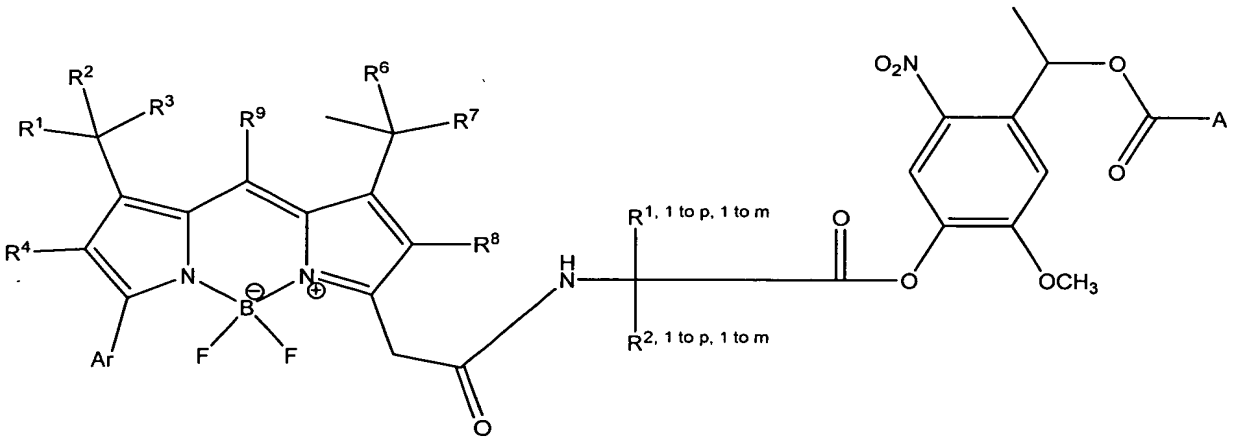
A = Ester activator, NHCH2CH2SH, or other linker
R1 to R9 = to be defined
R1, 1 to p, 1 to m and R2, 1 to p, 1 to m = to be defined
The R groups must be combined to have an equal number of non-titratable positive and negative groups to produce zwitterionic pairs
Ar = Aryl
r, n, m, p, q = 0, 1, 2, 3...
For each value of p, there are p values of m. These p values can be equal or different




**General structure of an optical labeling molecule comprising a BODIPY dye moiety**

A = Ester activator, NHCH2CH2SH, or other linker
CG = Cleavable group
R1 to R9 = to be defined
R1, 1 to p, 1 to m and R2, 1 to p, 1 to m = to be defined
The R groups must be combined to have an equal number of non-titratable positive and negative groups to produce zwitterionic pairs
Ar = Aryl
r, n, m, p, q = 0, 1, 2, 3...
For each value of p, there are p values of m. These p values can be equal or different

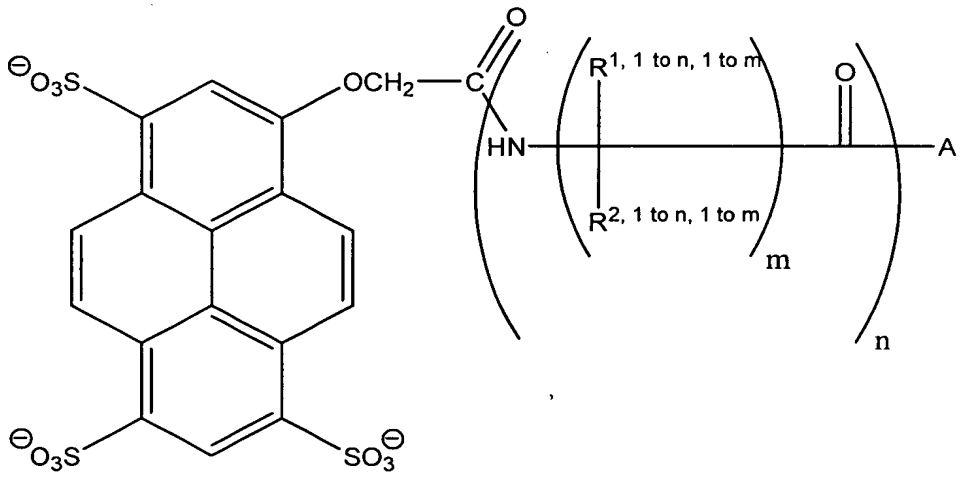
FIGURE 4




**General structure of an optical labeling molecule comprising a BODIPY dye moiety with a p-nitro anisole group**

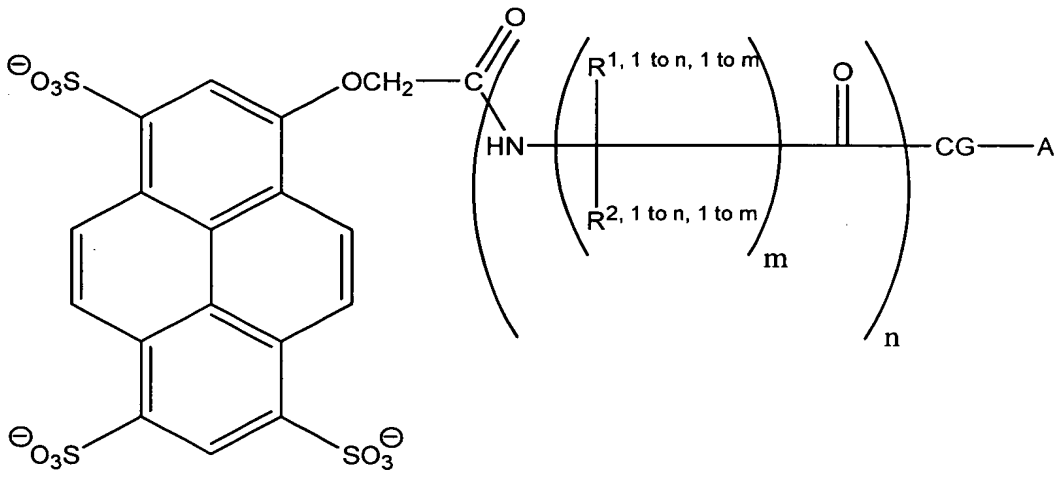
A = Ester activator, NHCH2CH2SH, or other linker
R1 to R9 = to be defined
R1, 1 to p, 1 to m and R2, 1 to p, 1 to m = to be defined
The R groups must be combined to have an equal number of non-titratable positive and negative groups to produce zwitterionic pairs
Ar = Aryl
r, n, m, p, q = 0, 1, 2, 3...
For each value of p, there are p values of m. These p values can be equal or different

FIGURE 5




**General structure of an optical labeling molecule comprising a Cascade Blue dye moiety**

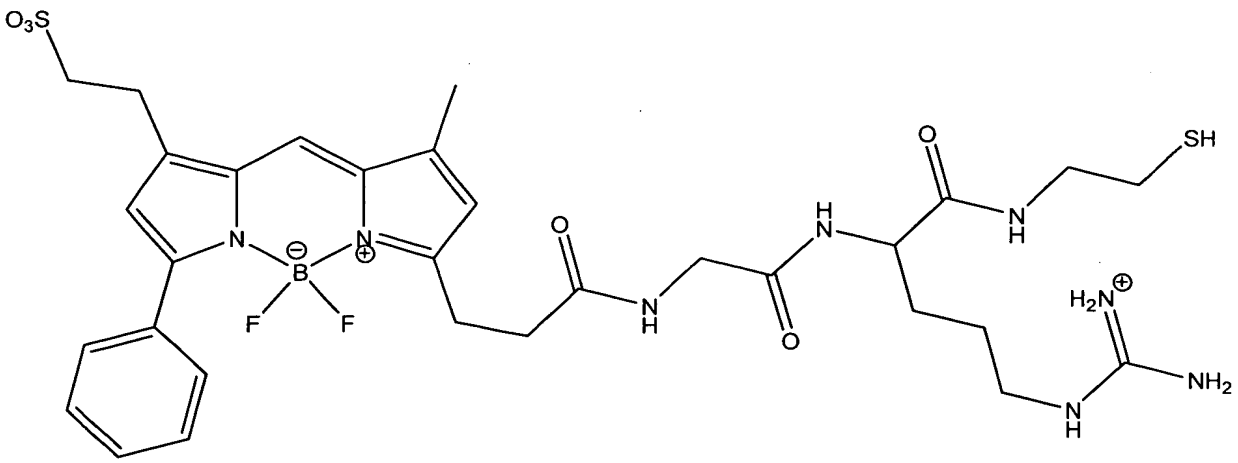
n, m = 1, 2, 3...
R1, 1 to n, 1 to m and R2, 1 to n, 1 to m = to be defined
Three non-titratable cationic groups must be included in the R groups
A = nucleophilic attack activator
For each value of n, there are n values of m. These n values can be equal or different




**General structure of an optical labeling molecule comprising a Cascade Blue dye moiety**

n, m = 1, 2, 3...
R1, 1 to n, 1 to m and R2, 1 to n, 1 to m = to be defined
Three non-titratable cationic groups must be included in the R groups
CG = cleavable group
A = nucleophilic attack activator
For each value of p, there are p values of m. These p values can be equal or different

FIGURE 6




A = Ester activator or NHCH2CH2SH
R1 to R5 = to be defined
Ar = Aryl
n, q, r = 0, 1, 2, 3...
m, p = 1, 2, 3...

General structure of an optical labeling molecule that can be used to label phosphorylation sites on proteins after beta-elimination of the phosphates from serine or threonine residues.

FIGURE 7

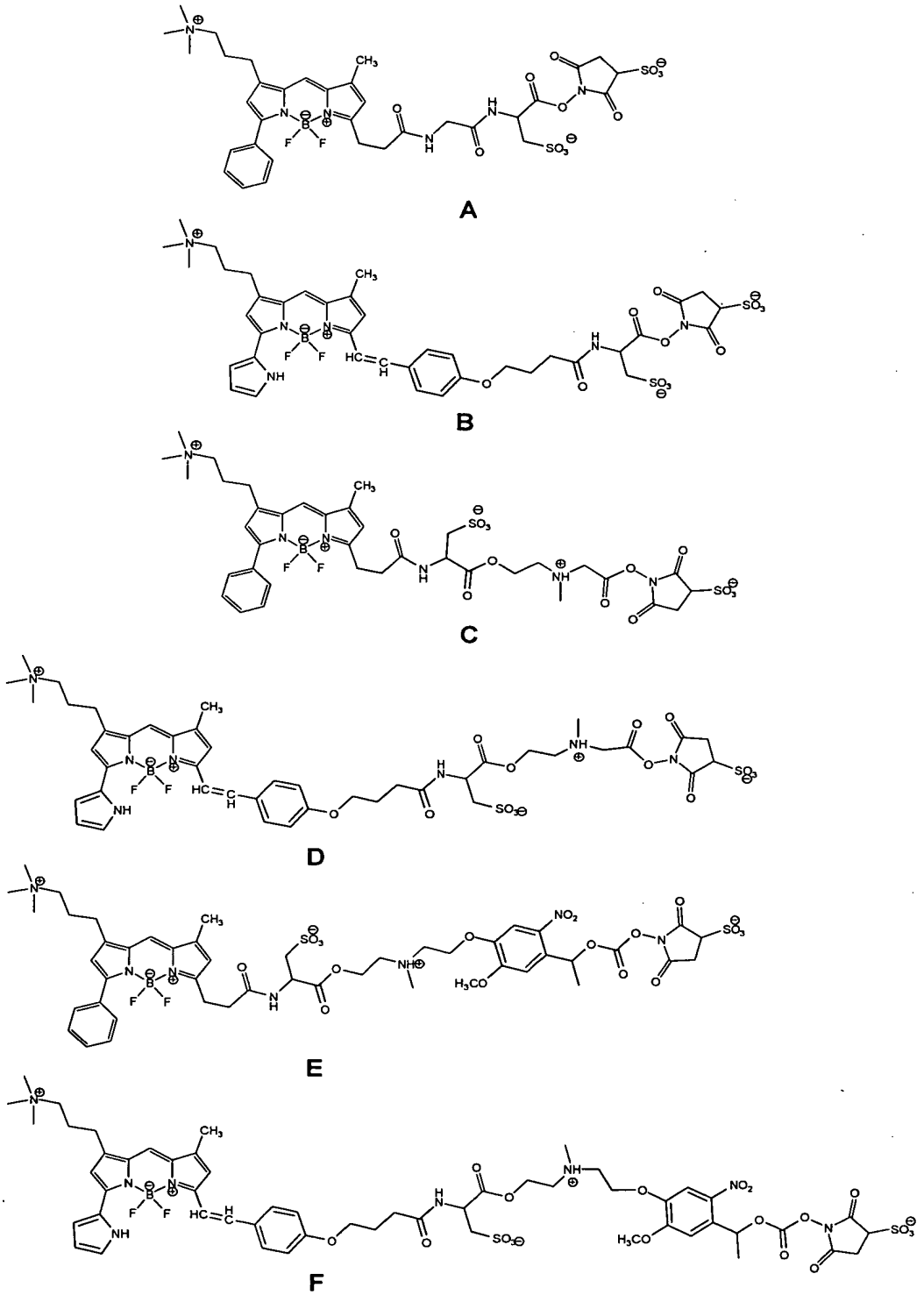
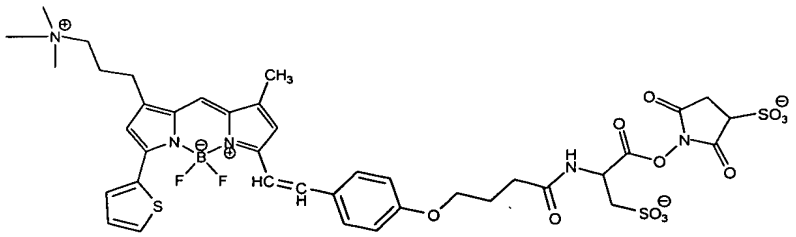
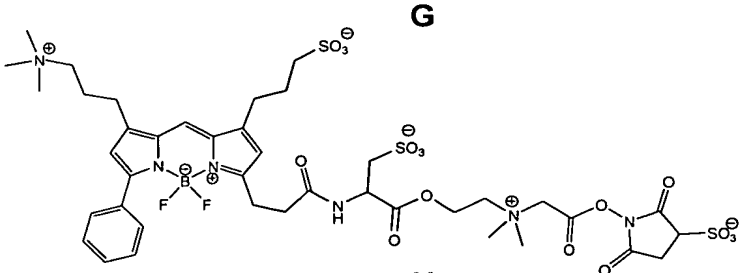


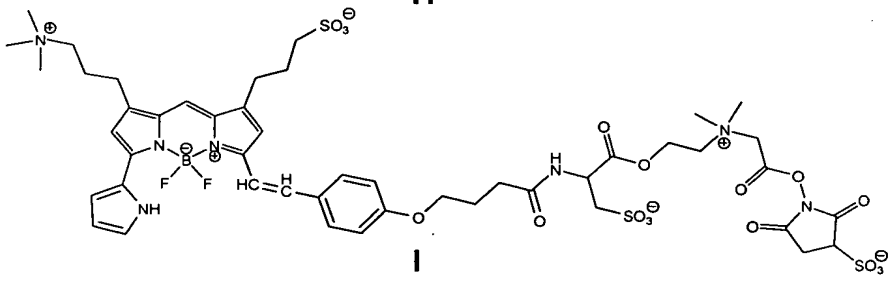

FIGURE 8A



G

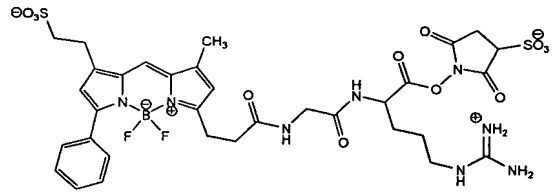


H

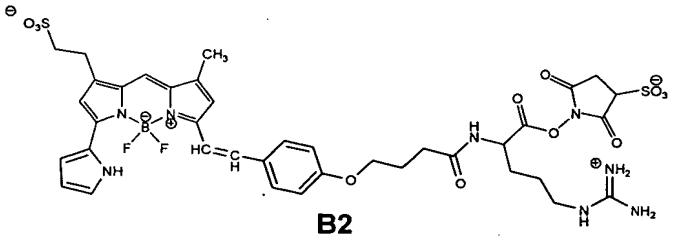


I

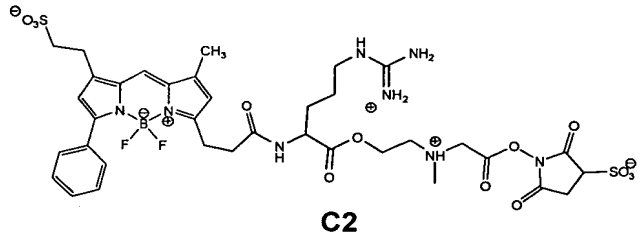
FIGURE 8B



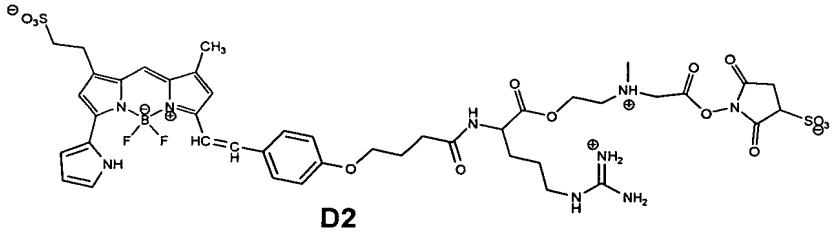
A2



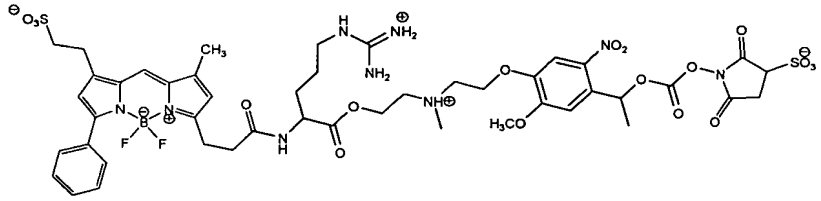
B2



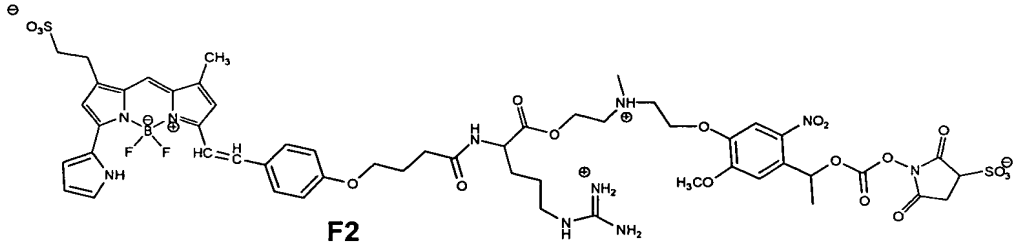
C2



D2

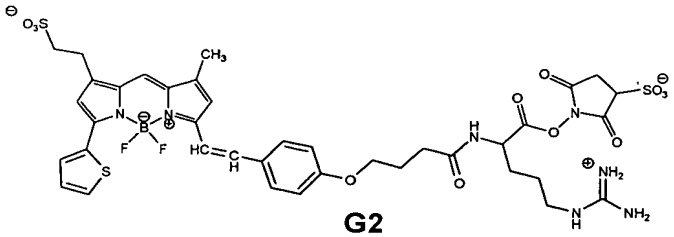


E2

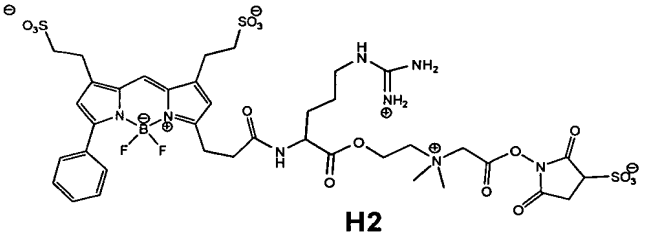


F2

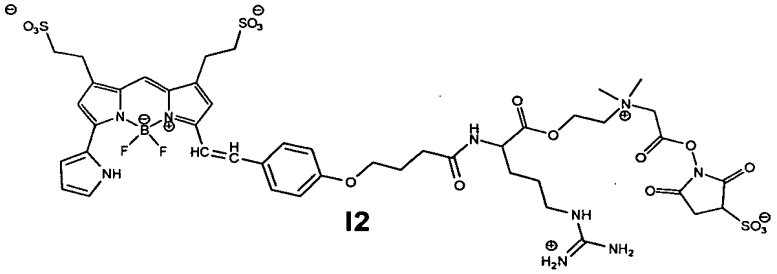
FIGURE 9A



G2

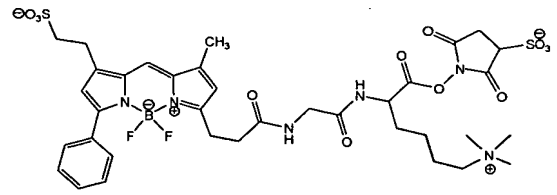


H2

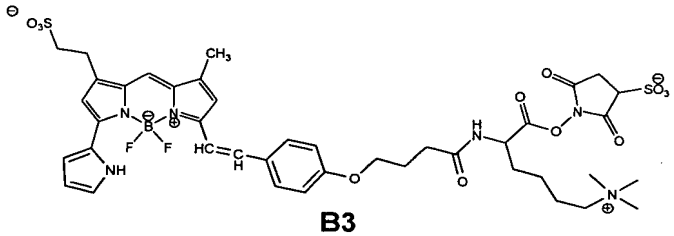


I2

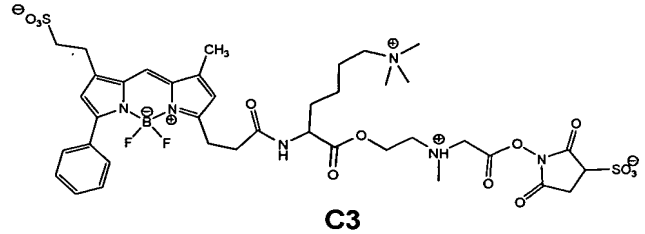
FIGURE 9B



A3

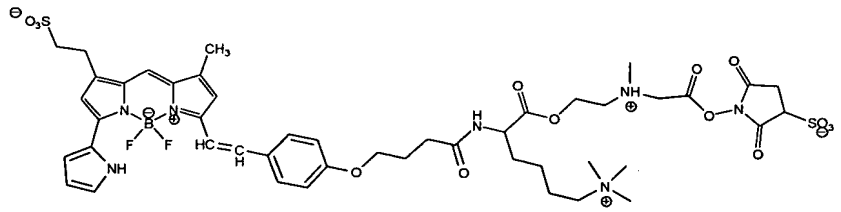


B3

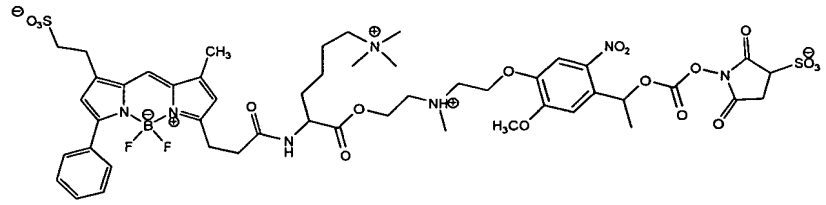


C3

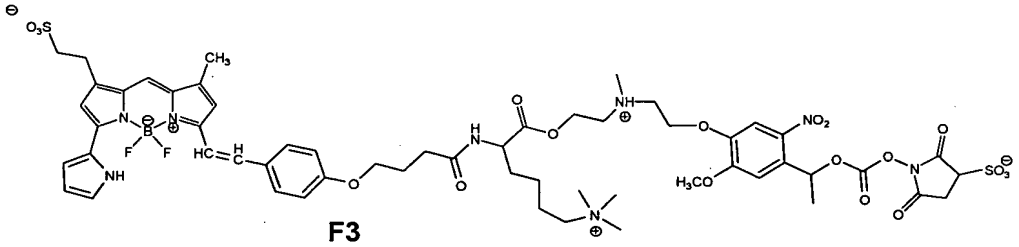
FIGURE 10A



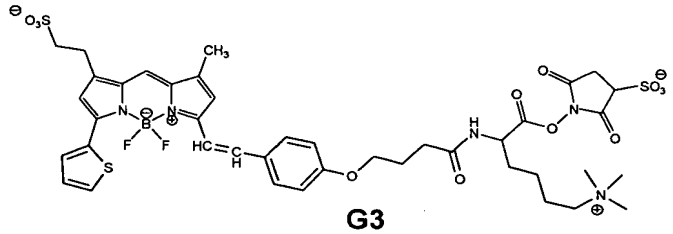
D3



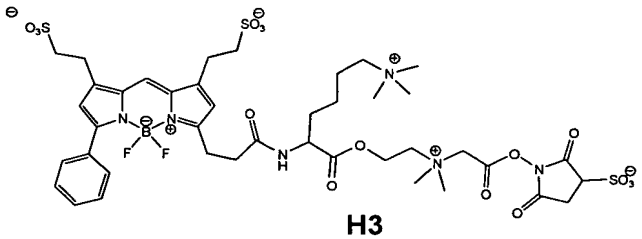
E3



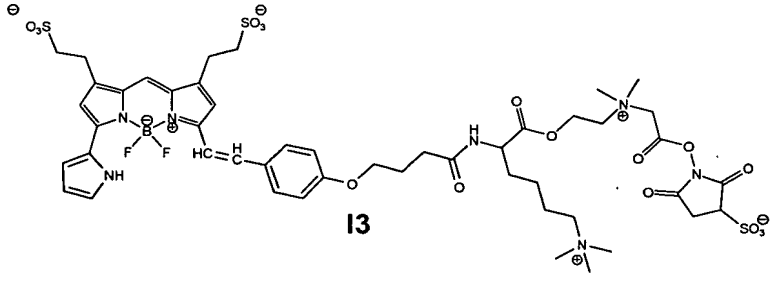
F3



G3



H3

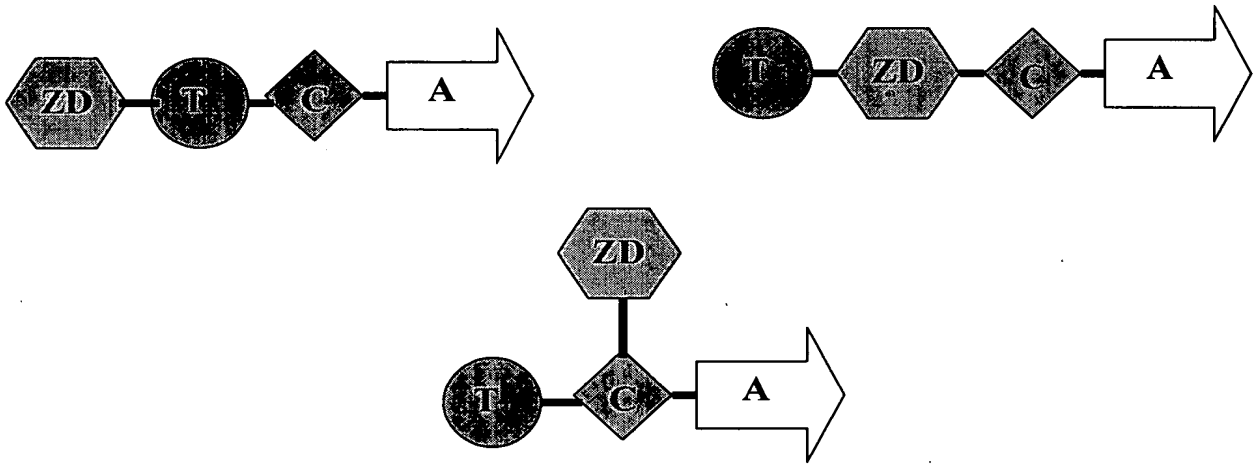


I3

FIGURE 10B

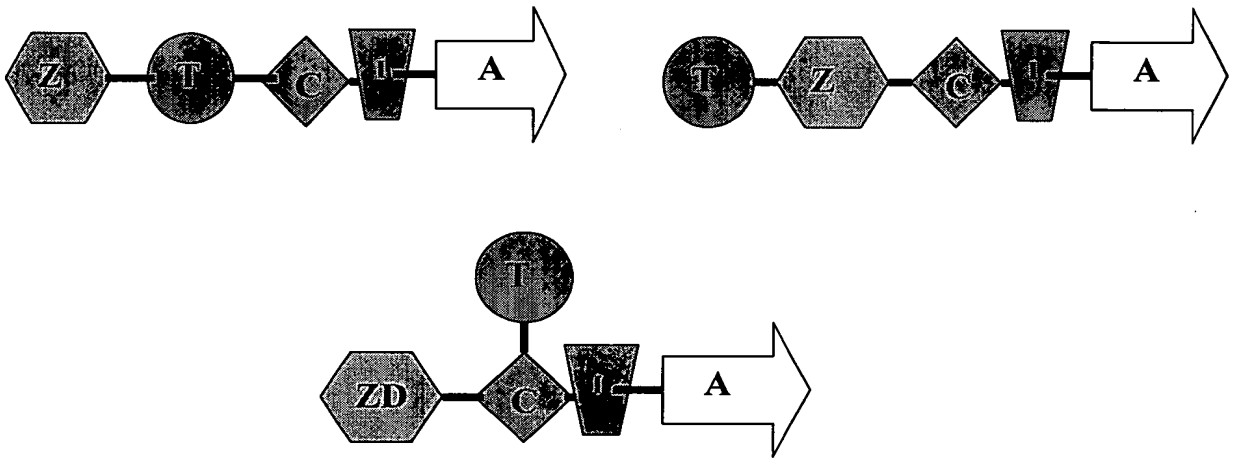

General structure of an optical labeling molecule wherein ZD is the zwitterionic dye moiety, T is the titratable group moiety, and A is the functional linker.

FIGURE 11



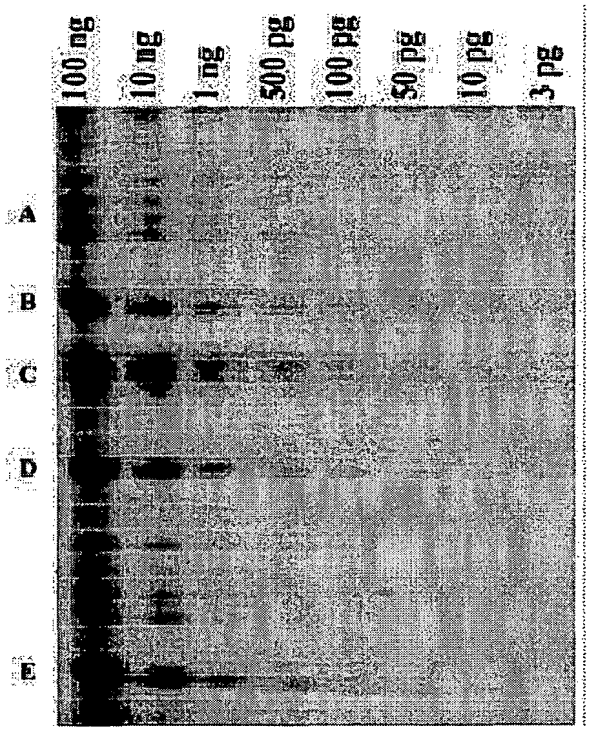

General structures of an optical labeling molecule wherein ZD is the zwitterionic dye moiety, T is the titratable group moiety, C is the cleavable moiety and A is the functional linker.

FIGURE 12



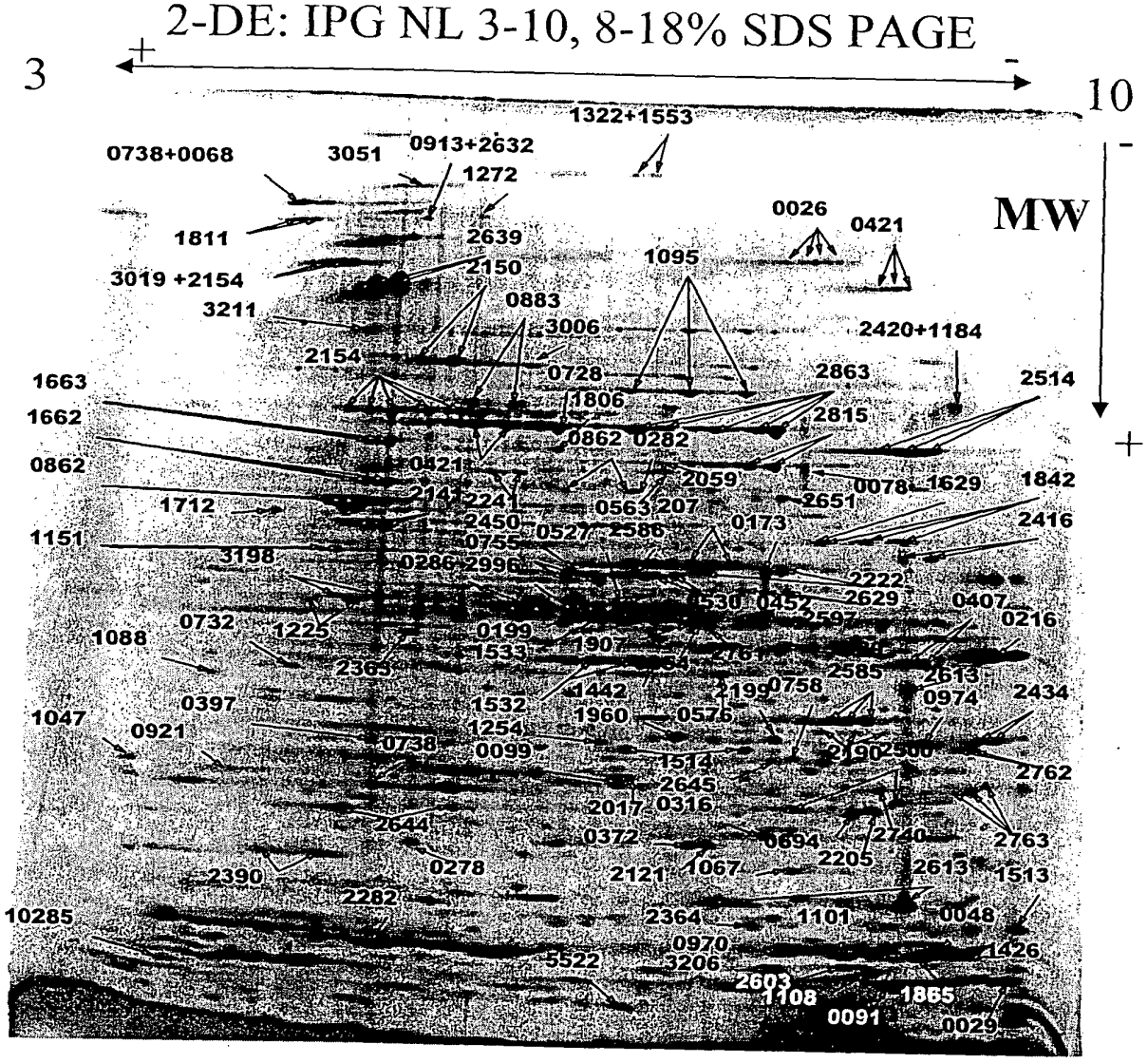

General structures of an optical labeling molecule wherein ZD is the zwitterionic dye moiety, T is the titratable group moiety, C is the cleavable moiety, I is the stable isotope moeity and A is the functional linker.

FIGURE 13




Gel showing the detection sensitivity obtained by prelabeling a set of standard proteins in SDS using a BODIPY dye from Molecular Probes

FIGURE 14




2D electrophoresis gel of separation of the proteins in the pH range 3-10 from the aqueous soluble protein extract*Sulfolbus solfataricus* P2 strain.

FIGURE 15